great calves make great heifers



Words by: Sue Macky

he true success of rearing dairy replacement calves is in achieving a fully grown, trouble free, inmilk heifer that gets back in calf on time without intervention. She will be socially adapted, skeletally fully grown, weigh 90% of the liveweight of the fully grown mature in-milk cows of the same genetic mix all at body condition score 4.5 and capable of performing at optimum for the specific farm system for many years. Achieving great heifers means rearing great calves, which begins prebirth.

IT STARTS WITH THE COWS

How we feed our pregnant cows especially in the weeks before calving, the circumstances under which cows calve, and even the length of the dry period can all affect the future survivability and productivity of our replacement heifer calves. Cows should be fed and managed prior to calving to achieve a rapid, troublefree calving delivering a strong healthy, well-nourished calf, and to be able to produce high-quality colostrum.

CALF REMOVAL

The debate about calf separation from the dam will be ongoing because of the emotion, anthropomorphism and lack of knowledge associated with it. The science is much clearer.

The sooner the calf is separated post birth the greater the survival rate of the calves and the healthier the cows. Bonding between cow and calf is not immediate for most – it takes some hours to develop strongly. (Some never want their calf, others want all calves!)

The stronger the bond, the greater the stress when it is broken. For the cow, this results in too much downtime without eating, which she cannot afford.

For the calf rearer, calves that have never suckled a cow are much easier to teach to suckle an artificial teat and can be fed a known quantity of quality colostrum on time.

Leaving calves with their dam does not increase the chances of the calf getting enough best quality, much needed colostrum quickly enough.

This has been a consistent finding in numerous studies worldwide over past decades, yet the optimum intake of best quality high immunoglobulin-containing colostrum as quickly as possible post birth is highly correlated with best calf health and survival.

Not all cows produce great immunoglobulin levels in their colostrum; hot weather pre-calving tends to reduce the quality, and the levels decline from



the point of calving onwards. The closer to calving that the cow is milked out, the better the colostrum and the lower the mastitis risk for the cow.

Sue Macky, Dairy Production Systems.

First-milking colostrum from cows

that have been calved for more than 12-15 hours should not be regarded as "Gold" – it is not suitable for the first two calf feeds.

Colostrum has two benefits for the young calf. First, it has immunoglobulin or antibodies that protect against diseases and need to get into the calf quickly while its gut will still allow these large protein molecules to be absorbed into the bloodstream.

Second, it has a high nutritive value that delivers more energy and proteins to the susceptible newborn – colostrum contains more per litre than whole milk.

The nutritive advantages remain after the "time limit" on colostral antibody absorption, i.e. it is the ideal growing feed for calves. A simple rule for giving colostrum is at least 10% of bodyweight within 10 hours of birth.

More is better but not if given at such large quantities as to overwhelm the capacity of the small newborn gut.





Five goals of calf rearing from birth to weaning:

- Supply the calf with enough nutrients to ensure that daily growth rates meet the target, and ensure appropriate size at weaning. This is a factor of both skeletal growth and liveweight gain. The calf must receive adequate quality proteins, fats, carbohydrates and minerals for muscle and bone growth.
- 2. For most of its life, the calf will depend on the functionality and health of its rumen and rumen microbes for its nutritional needs. The pre-weaning diet must encourage desirable gut microbial populations to multiply and thrive; must encourage optimum development of the surface area of the rumen, in particular the number and size of rumen papillae; and must develop the proper absorptive and protective functions of the rumen mucosa.
- 3. For much if not all of post-weaning life, NZ cattle must be able to consume and process large quantities of wet forage, mostly grazed pasture. To this end they need a muscular rumen that is physically fit and capacious, and the jaw muscle to do the grazing and cud chewing.
- 4. For best lifetime productivity, growing calves should be free of disease. Pre-weaning problems not attended to and fixed quickly can affect future production for at least three lactations if they make it that far.
- 5. Cattle are herd animals with defined mob social structure. Domestic cattle must also cope with humans. It is important that young calves are socially adjusted to both life in a group and to handling by people. These must be positive relationships, and they should be learnt young.

FEEDING REGIMES: OAD VS. TAD VS. ADLIB

Increasingly, research is showing that the more you mimic what should happen naturally, the better off the calf is, i.e. smaller feeds more frequently. 2.5 litres given 4-6 hours apart is better than 5 litres all at once.

There is research that shows feeding newborn calves smaller feeds four times a day for the first 48 hours, then three times daily for the first weeks, allows more total milk to be delivered with less risk. The result is a stronger, healthier calf and consequently a better heifer.

From our work with clients of Dairy Production Systems Limited over the past 25 years, and from numerous longitudinal studies worldwide (birth to death studies of productivity, disease and longevity), calves that got more milk in total and for more weeks produced better heifers and cows, which is the real target – not the fastest, cheapest animal to weaning.

Note that more milk does not mean only milk.

TEMPERATURE WARS: COLD VS. HOT

Milk should be fed warm – at calf body temperature ideally, just as for a human baby. The calf will have to use its own energy to "heat" its milk feed, energy not available for growth. Well-fed cows are very cold tolerant; young calves are not.

Feeding cold milk is a hazard for young calves. There is a noticeable difference in behavior and demeanour between those fed warm versus cold milk. In a worst-case scenario calves can starve to death when fed cold milk in a cold environment. The reserve of body energy they use heating milk (shivering) exceeds the energy they get from the milk. Cold milk is also associated with a higher disease incidence than warm milk.

Calves should be fed milk (or milk replacer powder) twice a day until at least 4-5 weeks of age. Don't lose sight of the true end result, which is not the quickest, least input calf rearing programme. Little calves are newborns – they need more than OAD. It is no coincidence that our best performing herds tend to feed milk for at least 10 weeks (maybe at very low volume OAD for the last couple of weeks but this ensures good skeletal growth) and until target weaning weight is achieved – calves must meet both age and size targets.

AFTER WEANING

Most weaned NZ dairy heifers are grown predominantly on grazed pasture and do not receive the nutrient-dense low volume dry supplement feeds of many other countries. Our pastures are often lower in calcium and/or copper than that needed for proper bone growth. Too often phosphate is also below target intake. These deficiencies do not impede daily gain in liveweight provided that the animals are fed enough but skeletal growth and bone density can be reduced – not an issue if you have a short life; (e.g. beef) but a potential problem for a lactating dairy cow.

Good bone begins pre-weaning. Feeding more milk, supplying all of the nutrients for the growth of the calf has a trade-off in that less complex, simpler solid feeds or meals are needed. NZ has some of the most



The RIGHT person Rearing calves successfully to weaning is a demanding job. It

- takes: • Patience
- Skill
- Attention to hygiene
- Empathy with young animals
- Careful observation combined with a "feel" for when things are not right
- Knowledge calf development, feeds, diseases etc
- The ability to be systematic and accurate.
- It is well worth investing in a suitable person, allowing them the time, resources, professional support and whatever training they need, and paying them well for their efforts and abilities.

complex meals in the world, which in itself has a cost but is necessary to make up for deficiencies in milk feeding. Less meal or fermentable carbohydrates fed also reduces the potential for acid damage to the rumen wall, and/or the development of liver problems or abscesses.

The best development of the rumen, needed for the future best performance of our dairy heifers, requires solid feed that supplies the nutrients needed by the rumen microbes to grow, multiply and ferment feed and to develop the functionality of the rumen mucosa and papillae. These nutrients are mostly specific amino acids and carbohydrates.

At the most basic level some sugar, starch, and quality protein are required – a solid, dry, calf meal of some sort. How much, and what, depend on personal preference, experience and how much milk is being fed. If milk feeding is reduced, then more calf meal is needed and it must be more nutritionally complete as it will need to supply the milk nutrients no longer being fed.

If milk feeding is adequate, then less meal of lower complexity is needed. There is no one ideal product that suits every situation. Similarly there is no "correct" quantity. Small amounts should be



Spend time and handle the calves: they need to learn to trust people.

available from the beginning when calves are exploring their environment. Keep it fresh and don't expect very young calves to consume more than a few grams initially. I have always fed 20% protein meals as long as that protein comes from quality feeds such as soybean meal, canola, lupins, and milk powder, and products with a mixed source of fermentable carbohydrates. Don't confuse high crude protein high NPN pasture with true protein needed for growth. As well as a rumen capable of fermenting feed and absorbing the resultant volatile fatty acids cows need a physically fit, muscular rumen and associated muscles such as the jaw. To this end, calves should always have physically effective fibre to chew and consume, like hay and straw, from the beginning. Calves have small mouths and a small gut - chop length should be appropriate.

For the very young calf, unprocessed oats is an option. This fibre contributes little to the growth of the pre-weaned calf; it is there to ensure that post weaning the calf has the physical ability to consume and process enough bulky wet forage to both sustain itself and maintain daily liveweight gain. Using straw bales as pen dividers is an easy way to both provide fibre and to maintain biosecurity between pens.

Clean, fresh, easily accessible drinking water should be available to all calves at all times from day one. This also means ensuring that when calves are outside they can actually reach the water in the troughs!

THE RIGHT REARER

Good calf rearers never ignore dull calves, those that drink erratically, those that appear not hungry or those that show any signs of illness; nor do they just reach for the antibiotics. TLC, persistence and anti-inflammatories are usually all that are needed if addressed promptly. Never underestimate the pain of inflammation or bruising associated with birth, transport or rough handling. Energy is the prime driver of immune function. Healthy calves need feed.

Housing should provide excellent ventilation above the calf, dry soft bedding, and adequate space. Compromise any of these and the risk of disease and/ or lowered growth rate increases. Do not allow bedding to get wet.

Young calves need to develop social skills and the ability to relate to each other. Initially, dominance is determined mostly by age and size but this does not necessarily remain the case. Calves need to learn to trust people. Gentle handling, being present, and patting calves especially around the head are all parts of this process.

Cows that trust people, and are rewarded appropriately, give more milk! Never undervalue the people rearing your calves – they are determining your farm's future profitability. There is no one right way or miracle product to rear great calves and heifers, but the principles are the same regardless of the system.

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Part 3 - New arrivals www.youtube.com/ watch?v=zbpylvzq7mU